

WHAT IS CLAIMED IS:

1. A copper alloy comprising 58 to 66 wt% of copper, 0.1 to 0.8 wt% of tin, 0.01 to 0.5 wt% of silicon, and the balance being zinc and unavoidable impurities, wherein a proportion of an alpha phase is 80 vol% or more.

2. A copper alloy as set forth in claim 1, wherein an apparent content B' of zinc in said copper alloy is in the range of from 34 to 39 wt%, said apparent content B' of zinc being expressed by the following expression:

$$B' = [(B + t_1q_1 + t_2q_2) / (A + B + t_1q_1 + t_2q_2)] \times 100$$

wherein A denotes the content (wt%) of copper and B denotes the content (wt%) of zinc, t_1 and t_2 denoting zinc equivalents of tin and silicon, respectively ($t_1 = 2.0$, $t_2 = 10.0$), and q_1 and q_2 denoting the contents (wt%) of tin and silicon, respectively.

3. A copper alloy as set forth in claim 1, which further contains at least one of 0.3 to 3.5 wt% of lead and 0.3 to 3.0 wt% of bismuth.

4. A copper alloy as set forth in claim 1 or 3, which further contains at least one of 0.02 to 0.15 wt% of phosphorus, 0.02 to 3.0 wt% of nickel, and 0.02 to 0.6 wt% of iron, the total amount thereof being in the range of from 0.02 to 3.0 wt%.

5. A copper alloy as set forth in claim 4, wherein an apparent content B' of zinc in said copper alloy is in the range of from 34 to 39 wt%, said apparent content B' of zinc being expressed by the following expression:

$$B' = [(B + t_1q_1 + t_2q_2 + t_3q_3 + t_4q_4) / (A + B + t_1q_1 + t_2q_2 + t_3q_3 + t_4q_4)] \times 100$$

wherein A denotes the content (wt%) of copper and B denotes

the content (wt%) of zinc, t_1 , t_2 , t_3 and t_4 denoting zinc equivalents of tin, silicon, nickel and iron, respectively ($t_1 = 2.0$, $t_2 = 10.0$, $t_3 = -1.3$, $t_4 = 0.9$), and q_1 , q_2 , q_3 and q_4 denoting the contents (wt%) of tin, silicon, nickel and iron, respectively.

6. A method for producing a copper alloy, said method comprising the steps of:

preparing raw materials of a copper alloy comprising 58 to 66 wt% of copper, 0.1 to 0.8 wt% of tin, 0.01 to 0.5 wt% of silicon, and the balance being zinc and unavoidable impurities;

casting the raw materials to form an ingot;

hot working said ingot;

cold or hot working the hot worked ingot;

annealing the cold or hot worked ingot at a temperature of 300 to 600 °C for two minutes to five hours; and

cooling the annealed ingot at a cooling rate of 0.2 to 10 °C/sec.

7. A method for producing a copper alloy as set forth in claim 6, wherein an apparent content B' of zinc in said copper alloy is in the range of from 34 to 39 wt%, said apparent content B' of zinc being expressed by the following expression:

$$B' = [(B + t_1q_1 + t_2q_2) / (A + B + t_1q_1 + t_2q_2)] \times 100$$

wherein A denotes the content (wt%) of copper and B denotes the content (wt%) of zinc, t_1 and t_2 denoting zinc equivalents of tin and silicon, respectively ($t_1 = 2.0$, $t_2 = 10.0$), and q_1 and q_2 denoting the contents (wt%) of tin and silicon, respectively.

8. A method for producing a copper alloy as set forth in claim 6, wherein said raw materials further contain at least one of 0.3 to 3.5 wt% of lead and 0.3 to 3.0 wt% of bismuth.

9. A method for producing a copper alloy as set forth in claim 6 or 8, wherein said raw materials further contain at least one of 0.02 to 0.15 wt% of phosphorus, 0.02 to 3.0 wt% of nickel, and 0.02 to 0.6 wt% of iron, the total amount thereof being in the range of from 0.02 to 3.0 wt%.

10. A method for producing a copper alloy as set forth in claim 9, wherein an apparent content B' of zinc in said copper alloy is in the range of from 34 to 39 wt%, said apparent content B' of zinc being expressed by the following expression:

$$B' = [(B + t_1q_1 + t_2q_2 + t_3q_3 + t_4q_4) / (A + B + t_1q_1 + t_2q_2 + t_3q_3 + t_4q_4)] \times 100$$

wherein A denotes the content (wt%) of copper and B denotes the content (wt%) of zinc, t_1 , t_2 , t_3 and t_4 denoting zinc equivalents of tin, silicon, nickel and iron, respectively ($t_1 = 2.0$, $t_2 = 10.0$, $t_3 = -1.3$, $t_4 = 0.9$), and q_1 , q_2 , q_3 and q_4 denoting the contents (wt%) of tin, silicon, nickel and iron, respectively.